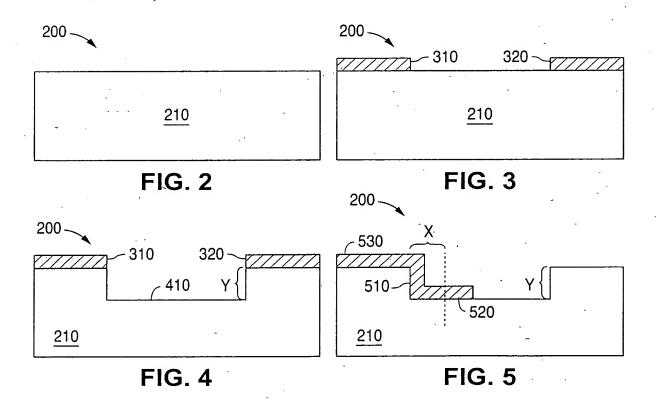
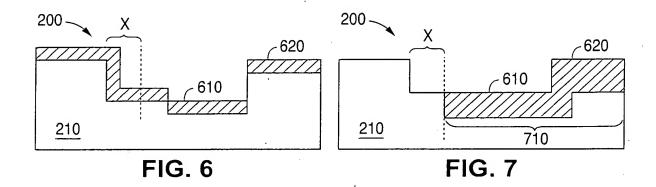


FIG. 1 (PRIOR ART)





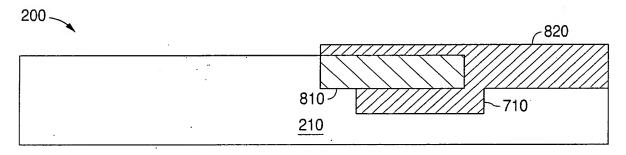


FIG. 8

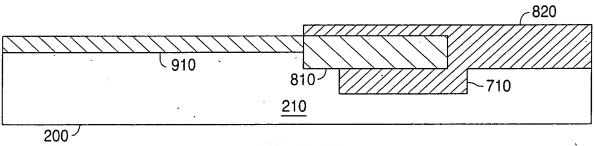


FIG. 9

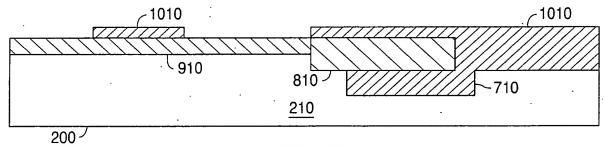


FIG. 10

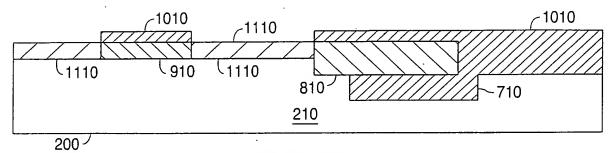


FIG. 11

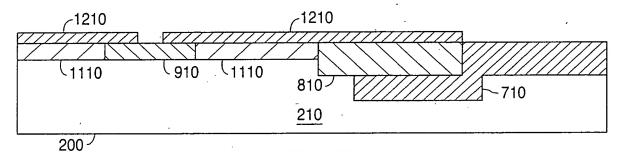


FIG. 12

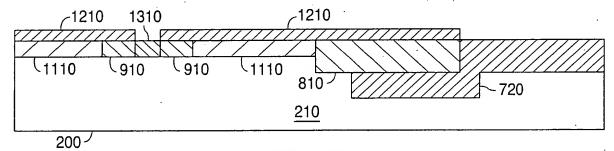


FIG. 13

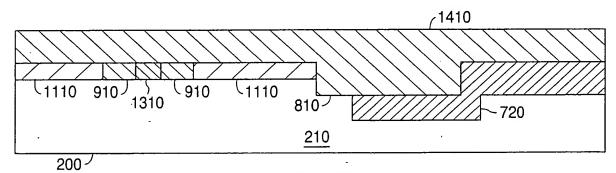


FIG. 14

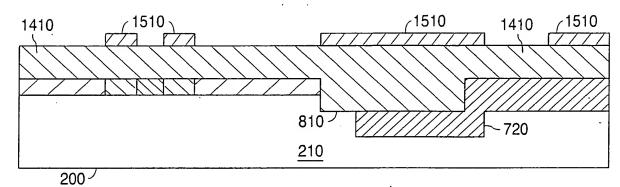


FIG. 15

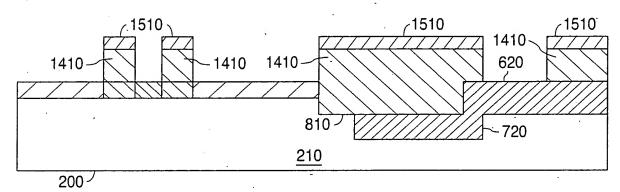


FIG. 16

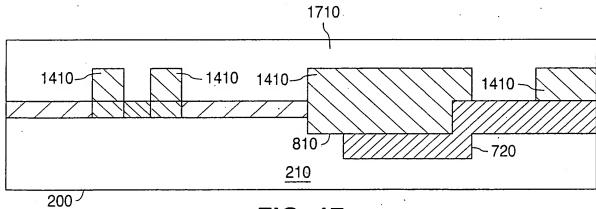


FIG. 17

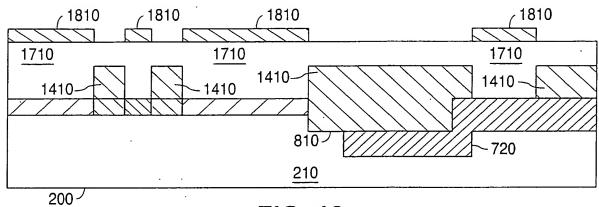


FIG. 18

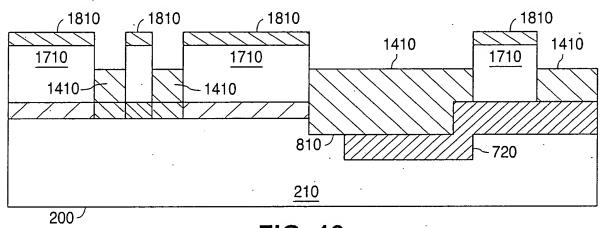


FIG. 19

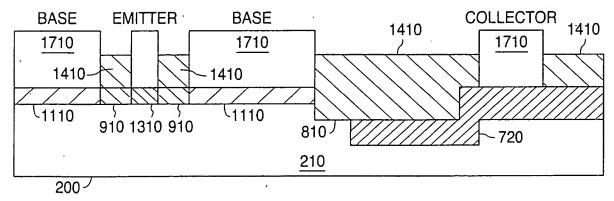


FIG. 20

c 2110

ON SUBSTRATE LAYER 210 PLACE TRENCH MASK 310 OVER A FIRST AREA (BASE/EMITTER AREA) AND PLACE TRENCH MASK 320 OVER A SECOND AREA (SINKER/COLLECTOR AREA)

c 2120

ETCH A SHALLOW TRENCH 410 IN SUBSTRATE LAYER 210
BETWEEN THE FIRST AREA AND THE SECOND AREA AND
REMOVE TRENCH MASKS 310 AND 320

c 2130

PLACE A COLLECTOR AND SINKER MASK 510, 520, 530 OVER THE PORTION OF THE BOTTOM OF SHALLOW TRENCH 410 THAT IS ADJACENT TO THE FIRST AREA

_/ 2140

SELECT THE LATERAL EXTENT OF THE HORIZONTAL PORTION 520 OF THE COLLECTOR AND SINKER MASK 510, 520, 530 TO CONTROL THE DISTANCE OF A SUBSEQUENT LATERAL DIFFUSION OF COLLECTOR PORTION 610 FROM THE FIRST AREA

c2150

PERFORM AN IMPLANT DOPING PROCEDURE TO DOPE COLLECTOR PORTION 610 AND SINKER PORTION 620 OF SUBSTRATE LAYER 210 AND REMOVE THE COLLECTOR AND SINKER MASK 510, 520, 530

c 2160

APPLY HEAT TREATMENT TO DIFFUSE THE DOPANT IN COLLECTOR PORTION 610 AND THE DOPANT IN SINKER PORTION 620 TO FORM SINKER AND COLLECTOR LAYER 710

2170 م

TERMINATE HEAT TREATMENT WHEN THE LATERAL DIFFUSION OF DOPANT IN COLLECTOR PORTION 610 REACHES A DESIRED DISTANCE FROM THE WALL OF TRENCH 410 ADJACENT TO THE FIRST AREA (BASE/EMITTER AREA)

TO STEP 2210

FIG. 21

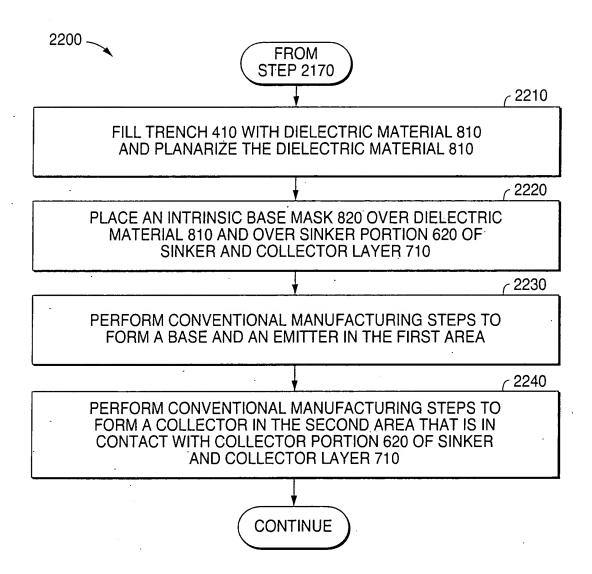


FIG. 22